

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: A01N 53/00, A61K 7/40 // (A01N 53/00, 25:24, 25:04)	A1	(11) International Publication Number: WO 95/07024 (43) International Publication Date: 16 March 1995 (16.03.95)
(21) International Application Number: PCT/GB94/01961 (22) International Filing Date: 8 September 1994 (08.09.94) (30) Priority Data: 9318869.6 11 September 1993 (11.09.93) GB (71)(72) Applicant and Inventor: PISACANE, Anthony [GB/GB]; 657 Stirling Road, Luggiebank, Cumbernauld G67 4AB (GB). (74) Agent: OUZMAN, Beverley; Murgitroyd & Company, 373 Scotland Street, Glasgow G5 8QA (GB).		(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD). Published <i>With international search report.</i>
(54) Title: REPELLANT MATERIAL (57) Abstract There is provided a repellent material composition comprising an insect repellent and a gel forming agent, wherein said insect repellent is pyrethrum. The composition is suitable for application to the skin and has a particularly long-lasting effect. The composition according to the invention is further capable of drying to form a microfilm layer on the skin, the layer being at least partially water-resistant, and a residue with the ability to repel insects remains on the skin after washing. <div style="text-align: right; margin-top: 200px;">[N]</div>		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

1 "Repellant Material"

2

3 The present invention relates to a repellant material,
4 and in particular to a material having insect repelling
5 properties.

6

7 Known compositions which repel insects and can be
8 applied to the skin normally contain diethyltoluamide
9 (deet), dimethylphthalate, di-N-propylisocinchomate,
10 N-octyl bicycloheptene dicarboxamide or mixtures of
11 these compounds as the active ingredient having the
12 desired insect repelling properties. However, although
13 such compounds are effective in repelling insects they
14 have the disadvantage that they can cause irritation to
15 the skin and skin rashes. In extreme cases more severe
16 illness, possibly leading to death, can result.

17

18 Other insect repellents containing vegetable extracts
19 are safer to use but are less effective in repelling
20 insects and have only a low protection time. Moreover,
21 this type of insect repellant tends to be oily or
22 greasy.

23

24 In addition many of the conventional insect repelling

1 compositions are completely washed away upon exposure
2 to water or aqueous solutions.

3
4 According to the present invention there is provided a
5 repellent material composition comprising an insect
6 repellent and a gel forming agent. The composition is
7 suitable for application to the skin and has a
8 particularly long-lasting effect. The composition
9 according to the invention is capable of drying to form
10 a microfilm layer on the skin, the layer being at least
11 partially water-resistant and a residue with the
12 ability to repel insects remains on the skin after
13 washing. In addition, the microfilm layer forms a
14 physical barrier, preventing insect bites.

15
16 By mixing certain compounds, properties can be produced
17 which affect certain organisms and these properties are
18 not known to be associated with the individual
19 components of the mixture.

20
21 Preferably the repellent material comprises a pyrethrin
22 (for example pyrethrum) which is effective in repelling
23 insects. In a preferred embodiment, a piperonyl
24 alkoxide is included in the composition and acts
25 synergistically with the pyrethrin to promote the
26 insect-repelling properties of the composition.
27 Preferably the alkoxide has up to 10 carbon atoms, for
28 example 2 to 8 carbon atoms.

29
30 The gel-forming agent may be any suitable agent capable
31 of forming a gel. Generally the gel formed should not
32 liquify when heated to a temperature lower than 40°C.
33 suitable gel-forming agents include polymeric compounds
34 such as cellulose, cellulose derivatives, alginate and
35 the like. The preferred gel-forming agent is alginate.

1 Optionally the composition may further include collagen
2 or glycerine as a component. Addition of 0.01 to 10%
3 by weight of collagen or glycerine promotes adherence
4 of the dried layer of gel composition on the skin.
5 Generally, 0.5 to 2% by weight of glycerine will
6 produce satisfactory results.

7
8 Additionally further ingredients may be included. For
9 example, binders (eg. resins), viscosifiers, buffers,
10 osmotic regulators, surfactants, emulsifiers,
11 dispersants, dyes, pigments or colorants, perfumes or
12 essential oils, and the like. Mention may be made of
13 sesame oil, orange oil, rosemary oil, black pepper oil
14 and the like which may be included in the composition
15 to produce a pleasant smelling gel. Certain essential
16 oils (such as, for example, rosemary oil and black
17 pepper oil) are also useful to prevent stinging, which
18 is especially useful where the skin has already been
19 bitten by insects.

20
21 In one embodiment the composition may further include
22 sunscreening components. Suitable sunscreening
23 components are well-known to those skilled in the art,
24 but particular reference is made to titanium dioxide
25 for inclusion in the present composition to impart
26 sunscreening properties thereto. The present
27 composition may be made to impart a recognised degree
28 of protection from sunburn as required, for example the
29 composition may be made to Factor 10 or 20.

30
31 The composition according to the present invention may
32 be applied to the skin and forms a non-toxic layer of
33 active substance which has the ability to repel
34 insects, such as flying insects for example mosquitos,
35 gnats and midges. The layer of composition on the skin

1 is dry, non-greasy and has a protection time of
2 approximately 6 hours.

3
4 In addition to being repellent to insects the
5 composition is insecticidal on contact.

6
7 In another aspect, the present invention also provides
8 a method of producing the composition described above,
9 said method comprising admixing an insect repellent and
10 a gel-forming agent.

11
12 In a further aspect, the present invention provides a
13 method of repelling insects from a surface, said method
14 comprising applying a composition as described above to
15 said surface.

*just
surface*

16
17 In a yet further aspect, the present invention provides
18 the use of a composition as described above to repel
19 insects.

20
21 The following Examples further illustrate the invention
22 in a non-limiting manner.

23

1 EXAMPLE 12 Gel Composition

3

4

% by weight

5	Alginate	6.5
6	Pyrethrum	0.47
7	Sesame Oil	3.74
8	Orange Oil	0.47
9	Water	88.82

100.00

10 The ingredients are blended together into a non-greasy
11 gel which can be applied to the skin to repel insects.

12

13 EXAMPLE 214 Gel Composition

15

% by weight

16	Alginate	2.0
17	Pyrethrum	0.15
18	Glycerine	1.00
19	Piperonyl butoxide	0.80
20	Rosemary Oil	0.10
21	Black Pepper Oil	0.10
22	Water	95.85

100.00

23

24 The ingredients are blended together into a non-greasy
25 gel which can be applied to the skin to repel insects.
26 titanium dioxide may be added to either composition to
27 provide the required degree of protection from the sun.

1 CLAIMS

2

3 1. A repellant material composition comprising an
4 insect repellant and a gel forming agent, wherein
5 said insect repellant is pyrethrin.

6

7 2. A composition as claimed in Claim 1, wherein said
8 gel-forming agent is alginate.

9

10 3. A composition as claimed in either of Claims 1 and
11 2 further comprising a piperonyl alkoxide.

12

13 4. A composition as claimed in Claim 3 wherein said
14 piperonyl alkoxide is piperonyl butoxide.

15

16 5. A composition as claimed in any of Claims 1 to 4
17 further comprising glycerine.

18

19 6. A composition as claimed in any of Claims 1 to 5
20 further comprising a sunscreensing component.

21

22 7. A composition as claimed in Claim 6 wherein
23 titanium dioxide is present as said sunscreensing
24 component.

25

26 8. A repellant material composition substantially as
27 hereinbefore described.

28

29 9. A method of producing a composition as claimed in
30 any of Claims 1 to 8, said method comprising
31 admixing pyrethrum and a gel-forming agent.

32

33 10. A method of producing a repellant material
34 composition as claimed in any of Claims 1 to 8
35 substantially as hereinbefore described.

- 1 11. A method of repelling insects from a surface, said
2 method comprising applying a composition as
3 claimed in any of Claims 1 to 8 to said surface.
4
- 5 12. The use of a composition as claimed in any one of
6 Claims 1 to 8 to repel insects.

INTERNATIONAL SEARCH REPORT

Intern. Appl. No.
PCT/GB 94/01961

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A01N53/00 A61K7/40 //(A01N53/00,25:24,25:04)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A01N A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP,A,0 251 464 (THE BOOTS) 7 January 1988 see page 2, line 11 - page 3, line 8 see page 3, line 14 - page 4, line 16 see page 5, line 33 - page 6, line 13 see page 6, line 28 - line 32	1,3-6, 8-12
Y	---	2,7
Y	FR,A,2 599 220 (MEDITERRANEENE D'AEROSOLS) 4 December 1987 see page 1, line 4 - line 16 see page 1, line 35 - page 2, line 6 see page 2, line 33 - line 36 see page 3, line 22 - line 24 see page 4, line 2 - line 3 see page 4, line 15 --- -/-	2

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

1 December 1994

Date of mailing of the international search report

16. 12. 94

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lamers, W

INTERNATIONAL SEARCH REPORT

Inten. Appl. No.
PCT/GB 94/01961

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SEIFEN, OLE, FETTE, WACHSE, vol.117, no.10, 26 June 1991, AUGSBURG DE pages 397 - 398 'Tioveil - ein neuer Sonnenschutzfilter' see the whole document ---	7
Y	SEIFEN, OLE, FETTE, WACHSE, vol.114, no.10, 24 June 1988, AUGSBURG DE page 407 J.H.OMBAKA 'Natural Insecticide Cream and Lotions' see the whole document ---	1-12
Y	SEIFEN, OLE, FETTE, WACHSE, vol.110, no.10, June 1984, AUGSBURG DE pages 297 - 300 E.CHARLET ET AL. 'Repellentien zur Anwendung auf der Haut' see page 300, column 1, paragraph 4 ---	1-12
Y	US,A,4 393 048 (A.MASON ET AL.) 12 July 1983 see column 2, line 3 - line 61 ---	1-12
X	EP,A,0 041 654 (BAYER) 16 December 1981 see page 3, line 22 - page 5, line 10 see page 6, line 1 - line 5 see page 6, line 16 - line 20 see page 7, line 2 - line 3 ---	1-4,8-12
X	WO,A,89 06904 (S.LEUTHOLD) 10 August 1989 see page 1, line 1 - line 5 see page 1, line 20 - line 26 see page 2, line 22 - page 3, line 12 see page 4, line 26 - line 30 see page 5, line 4 - line 19 ---	1,8-12
X	DATABASE WPI Week 8216, Derwent Publications Ltd., London, GB; AN 82-31655E [16] & JP,A,57 042 613 (LION) 10 March 1982 see abstract ---	1,8-12
A	GB,A,2 207 605 (SUMITOMO) 8 February 1989 see page 1, line 1 - line 7 see page 3, line 23 - line 24 see page 4, line 4 - line 8 see page 4, line 17 -----	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 94/01961

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0251464	07-01-88	AU-B- 600945 AU-A- 7343887 JP-A- 62289505 ZA-A- 8703265	30-08-90 03-12-87 16-12-87 29-10-87
FR-A-2599220	04-12-87	NONE	
US-A-4393048	12-07-83	NONE	
EP-A-0041654	16-12-81	DE-A- 3021725 AU-B- 538164 AU-A- 7142781 JP-B- 1048241 JP-C- 1565141 JP-A- 57026601 SU-A- 1077554 US-A- 4568541	17-12-81 02-08-84 17-12-81 18-10-89 25-06-90 12-02-82 29-02-84 04-02-86
WO-A-8906904	10-08-89	CH-A- 676412 CA-A- 1312006 EP-A- 0352316	31-01-91 29-12-92 31-01-90
GB-A-2207605	08-02-89	JP-A- 1038004 JP-A- 1093505 AU-B- 610906 AU-A- 1923488 SE-A- 1001100 FR-A- 2618671	08-02-89 12-04-89 30-05-91 02-02-89 11-07-89 03-02-89